

Stopping A Toppling Tower

by Mary Kay Carson

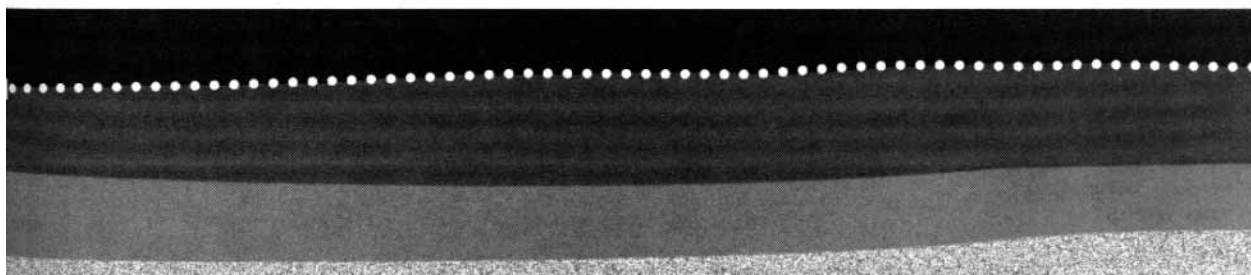
Every year, the Leaning Tower of Pisa (PEA-zuh) tilts a fraction of an inch farther! If it tilts too far, this famous Italian building could topple or crash to the ground. Scientists had to find a way to save the tower—without making it a “Straight Tower of Pisa.”

It's amazing but true that the tower has been tilted ever since it was built more than 900 years ago. The problem is that each year it leans a tiny bit more. In 1990 **engineers** said that the tower was in danger of toppling. The building was no longer safe. It had to be closed to visitors.

For years, engineers and scientists had been thinking about how to stop the tower from falling over. After considering many ideas, they agreed on a possible solution. In 1998, engineers started work to save the **landmark**.

The Problem

1. The tower weighs 14,000 tons. Wind pushes from the sides. Sometimes there are small earthquakes that rattle the building. These forces weaken the slanted tower.
2. Tall, skinny shapes are hard to balance. A skinny tower has a small **foundation**. That makes it easy for it to tilt too far to one side. Then—TIMBER!
3. The tower is built on soft sand and clay. The heavy building squishes the soft soil beneath it. That makes the tower slowly sink. Why does it lean? The soil is softest under the tower's low side, so that side sinks more.
4. As the tower leans, more of its weight rests on the lower side. That **compression**, or squeezing, could cause the tower to tip over.

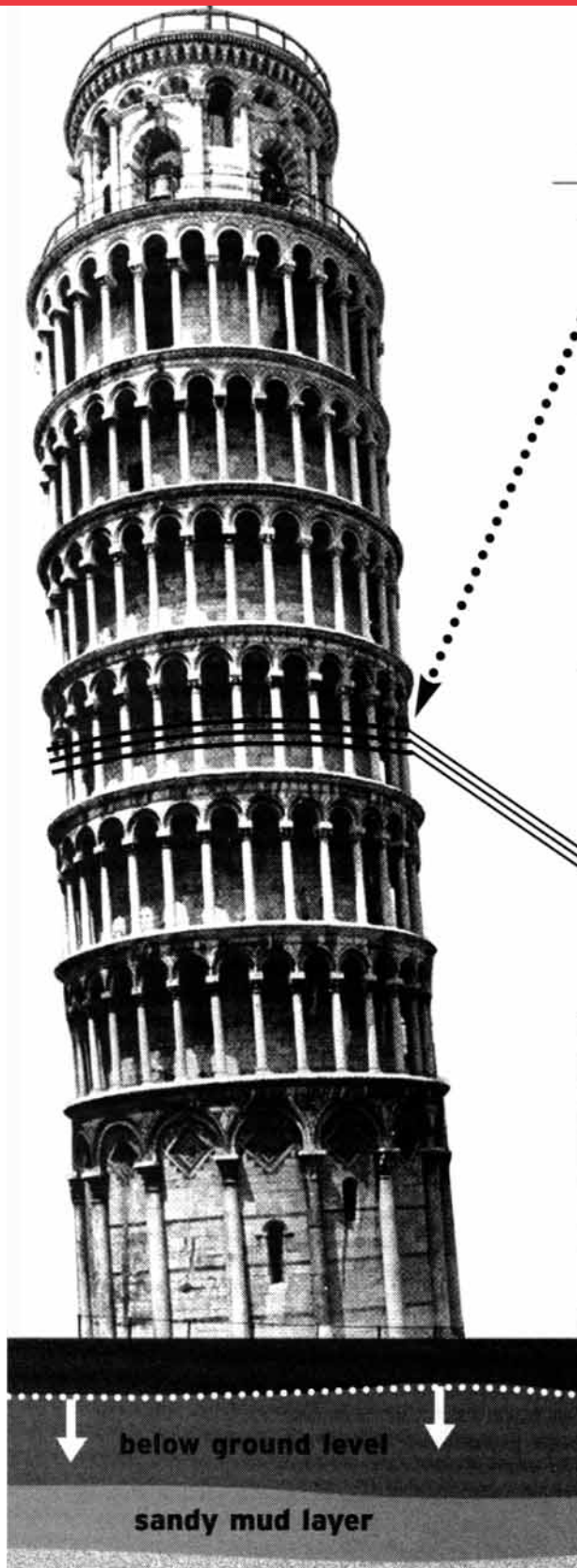


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The Solution

1. First, workers wrapped steel **cables** around the tower. The cables were heavy ropes made of steel wire. Workers hooked the ends of the cables to heavy weights. If the tower started to topple, the cables would hold it up.
2. The workers started to dig under the high side of the tower (the right side in the photo). They slowly and carefully took away some of the soil. They hoped that the tower would sink a little on that side. It did—by one inch! That may not sound like much, but it was enough to make the tower straighter.
3. No one can see the change in the tilt of the tower, but now it's safe. It was reopened in January 2002. Once again, visitors come from all over the world to see it and climb to the top. Engineers expect that the tower will stand—tilted—for centuries to come.

Thanks, But No Thanks...

People have sent hundreds of tower-fixing ideas to the Italian government. Why do you think these four ideas were rejected? What ideas do you have?

1. Freeze the ground under the tower.
2. Slice off the top to make the tower lighter.
3. Hitch a car to the tower and pull the tower straight.
4. Stuff rice and beans under the low side. When the foods absorb water, they will swell and push up the tower.

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Read the passage "Stopping a Toppling Tower." Then, write a paragraph explaining which text structure is used by the author. Use evidence from the passage and from the chart below to prove your answer.

Text Structures

Text Structure	 Signal Words	 Signal to Reader
Description or list _____ _____ _____	<i>such as, for example, for instance, most important, in front, beside, near</i>	A list or set of characteristics will follow.
Sequence or time order 	<i>first, second, third, before, on (date), not long after, after that, next, at the same time, finally, then</i>	A sequence of events or steps in a process is being described.
Compare and contrast 	<i>like, unlike, but, in contrast, on the other hand, however, both, also, too, as well as</i>	Likenesses and differences are being presented and/or discussed.
Cause and effect Problem and solution 	<i>therefore, so, this led to, as a result, because, if ... then</i>	Evidence of cause(s) and effect(s) will be given or problems and solutions will be described.